

**Daniel W. McKeel, Jr., M.D. Second Set of Comments on the
“Long Term Stewardship Plan For the U.S. Department
of Energy, Weldon Spring, Missouri, Site”
Dated August 9, 2002**

Introduction:

My Part 1 Comments were hand delivered by me to Pamela Thompson (DOE-WSSRAP), Art Kleinrath (DOE-GJO), Robert Geller (MDNR) and Commissioner Don Price (to be distributed to WSCC) on 8/28/02 at the public workshop. I also informed Mimi Garstang of MDNR I had given her copy to Mr. Geller, and they agreed that Bob Geller would make copies to distribute. These comments dealt with specifics of the plan on a page by page line item basis referring to specific sections, subsections and page numbers of the document.

At Art Kleinrath's request the next day, I e-mailed copies of the two electronic files (LTSM 8/9/02 draft plan pages 1-56, page 57-126) that comprised my Part 1 comments and Mr. Kleinrath acknowledged receiving them. Helene Diller of WSCC verified that she and Pam Thompson (DOE WSSRAP project Director) had received their copies.

The following document constitutes my Part 2 Comments that extend comments made in my part 1 review of the 8/9/02 stewardship plan for Weldon Spring Site. The organizing principle for these second set of comments was the “Index to the Long-Term Steward-ship Plan” made available to stakeholders at the public workshop held on 8/28/02 at the WSSRAP Interpretive Center.

C-1 | Comment #1 is the document Index should be made part of the final plan. The second is that all of the maps that were included in attendee's RED, GREEN and BLUE packets at the 8/28/02 meeting should be included in the final plan.

Response C-1: DOE does not intend to include the index. DOE does not intend to incorporate the figures used at the August 28, 2002, workshop because they contain the same information as existing figures in the LTS Plan.

Respectfully submitted,

Daniel W. McKeel, Jr., M.D. 9-08-2002

COMMENTS KEYED TO SPECIFIC SECTIONS

- **Applicable or Relevant and Appropriate Requirements** - No additional comments

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POINT [1] - CONFUSING STEWARDSHIP BUDGET INFORMATION

- C-2 • **Budget and funding (§3.1.1)** - This section has no projected budget numbers, yet a previous document (McKeel, part 2, reference 1) lists specific stewardship budget targets by five year increments from 2003-2070. Costs are estimated as \$1,005,589 annually from 2003-2010 and are \$5,027,945 for each 5-year interval from 2011 - 2070 (same amount per year). We understand that actual budget allocations are made by Congress on an annual basis, yet it is difficult to understand how it is possible to make very specific budgets for the next 67 years in one report, and yet have no specific budget figures in the 8/9/02 LTSM draft plan. More specific and realistic budget numbers should be stated for the Weldon Spring Site as a guide for stakeholders.

Response C-2: DOE will incorporate funding estimates in the LTS Plan.

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POINT [2] - HAUL ROAD AND CELL ELEVATED RADIOACTIVITY

- **Contamination left in place**

- C-3 **Section §2.3:** The mention of the haul road/Hamburg hiking and biking trail does not mention any radiation monitoring data showing stakeholders that the haul road is safe for the intended recreational usage. Nor do the sections that deal with Institutional Controls (sections §2.6, 3.7, Appendix B, Figure B-1).

This section should be amended to include two additional ICs based on new data I have just received (9/05/02) in response to a letter I wrote to Pamela Thompson on August 10, 2002. In the letter I asked for radiation measurement data that would demonstrate that use of the disposal cell and the Hamburg trail as recreational tourist attractions posed no health danger to the public.

Response C-3: See [Response to comment C-4](#).

- C-4 (a) **New data on the haul road/Hamburg trail that appears to mandate instatement of Institutional Controls.** Raw data sheets indicate this information was not generated until 8/16/02 after my letter of 8/10/02 was submitted. Also, I did not receive my response letter until September 5, 2002 twenty days later and 8 days after the 8/28/02 public workshop was held. It is of extreme concern that DOE, MDNR and MDOC did not have this data in hand when they were confidently assuring the public no health or safety problem was connected to their use of the Hamburg Trail. Even if DOE's judgement is the CPM data is not elevated to the unsafe range (as I believe it is), still they should have gotten confirmatory data of this type long ago.
- Radioactivity counts 1.5 times "background counts" of 5,500 CPM were reported. That is, levels of 8,500 CPM were judged to present no health concern. I believe these numbers are very high and that CPM counts in one's back yard, for example, should be more like 10 CPM, or 550 to 850-fold lower. Counts this high appear to mandate

C-4
cont.

restrictions on the use of the trail as a recreational facility. I request that ATSDR be called in immediately to evaluate this new data. The monitoring data also needs to be evaluated in the LTSM plan.

Response C-4: The radiological monitoring of the Hamburg Trail in question was performed after your letter was submitted. Radiological monitoring had been performed on the former quarry haul road routinely between 1992 and 2001. These records have been transferred to archived storage at a federal records retention center in Kansas City, MO, therefore additional data was collected to respond to your comment.

Familiarity with the type of radiological instrument used to monitor the Trail is vital to understanding the radiological monitoring data from this instrument. A sodium iodide (NaI) gamma scintillation detector (2 in. by 2 in. crystal) was used. This is a common radiological instrument used routinely at sites around the world for monitoring areas, including roadways. Background count rates with this instrument are typically on the order of 4,000 to 8,000 counts per minute (cpm) on gravel roadways, and 8,000 to 12,000 cpm for soil areas (wide range due to the variation of individual instruments). These background count rates are common knowledge to those familiar with these detectors. For reference, note that in Table 6.7 (page 6-47), footnote a of the *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)* (EPA 402-R-97-016) December 1997, the background count rate for a 2 in. by 2 in. NaI detector when monitoring soil is assumed to be 10,000 cpm.

An action level of 1.5 times background for a NaI gamma scintillation detector is consistent with action levels used by most other sites in the country. This is the same action level that was used during the site soil confirmation process at the site. This is standard practice for use of this instrument in similar situations around the country.

The Trail was also monitored using a Geiger-Mueller (GM) detector, which primarily responds to beta and gamma radiation (it also detects alpha radiation but the efficiency is low). This data was compared statistically to data collected with the same GM detector from site gravel roads. Based on the statistical comparison of the two data sets using the t-test, there is not a statistically significant difference between the means of the two samples at the 95% confidence level. This is additional documentation of the no-contamination status of the Hamburg Trail.

C-5

(b) **New data that appears to mandate instatement of Institutional Controls for the engineered disposal cell steps to the top and the top platform designed for visitors.** Raw data sheets indicate this information was not generated until 8/29-20/02 after my letter of 8/10 was submitted and the 8/28 second LTSM workshop had been held. Also, I did not receive my response letter until September 5, 2002 twenty days later. It is of extreme concern that DOE, MDNR and MDOC did not have this data in hand when they were confidently assuring the public no health or safety problem was

C-5
cont.

connected to their use of the disposal cell as a tourist attraction. **Radioactivity measurements with two different detectors on the steps and top platform ranged between 1962 and 3408 CPM.** Of interest, the haul road measurements made two weeks earlier were even higher. Even if DOE's judgement is the CPM data is not elevated to the unsafe range (as I believe it is), still they should have gotten confirmatory data of this type long ago. The new data needs to be added to and discussed in the LTSM plan.

Radioactivity counts less than 1.5 times "background counts" (the actual background number or it's derivation isn't clear) were reported. Again, I believe these numbers are very high and that CPM counts in one's back yard, for example, should be more like 10 CPM, or 196 to 340-fold lower. Counts this high appear to mandate restrictions on the use of the cell as a tourist facility. Not only is the cell an "attractive nuisance" in legal Institutional Control terms, it is a *dangerous* attractive nuisance.

Response C-5: See [response to comment C-4](#).

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POINT [3] - CELL INVENTORY

Disposal cell

C-6

The disposal cell **subsection §2.3.2**, pages **2-15 through 2-20**, mentions the engineered construction cell design and construction features. The section heading suggests the reader will get cell inventory information. That is, what exactly was placed in to the cell? The lack of specifics in this section conflicts with **subsection 2.2.2.2** on pages 2-10 and 2-11 where one finds very specific information on the types of materials that were placed within the disposal cell ("**1.48 million cubic yards (1.13 million cubic meters) of source materials, including building debris, asbestos containing materials, treated raffinate sludge, contaminated soils, drums, process equipment, recycled uranium, and quarry bulk wastes, were disposed of in the cell.**") Note that no breakdown of radioactive substances other than recycled uranium were stated. This statement in turn conflicts with a DOE response letter dated 1-24-2002 that Pamela Thompson sent to Dan McKeel in response to Question 1 as follows:

Response C-6: See response to comments [A-7](#) and [A-56](#).

C-7

MCKEEL QUESTION #1: "Can I get a detailed inventory of the materials now stored permanently in the disposal cell? I am interested in both the non-radioactive and the radioactive components. In a letter Kay Drey shared with me, that was written to Steve McCracken by M-K Ferguson dated July 24, 2000, the cell was said to contain **7,582 Curies** of radioactivity. This number is so detailed it implies there must be an exact inventory of the radioactivity placed into the cell during the lifetime of the former Weldon Spring Ordnance Works and the Weldon Spring DOE Superfund remediation efforts. I would like to see a list of how that 7,582 Curie figure was derived—what are the isotopic breakdowns of uranium (by isotope if possible, e.g., U-235, U-234, U-238 etc.), thorium, plutonium, radium^{226, 228}, Tc-99, etc.? I would like as detailed information

C-7
cont. as is available. It seems to me this is the essence of the remediation and the bottom line on the more than \$900 million spent so far—*what exactly has been remediated and placed into long term safe storage in the cell?* The public definitely has a right to know this vital information.

Response C-7: See response to comments [A-7](#) and [A-56](#).

C-8 **PAM THOMPSON'S ANSWER TO MCKEEL QUESTION:** “The estimated inventory for the radionuclides is presented below. To clarify ... the actual value was 7044 Ci. These estimates were generated simply by taking the specific activity of the waste streams (contaminated soils, sludges and other materials) and multiplying by the volume. We considered rounding the final value since there is some error likely, but decided to present it as calculated out. The estimated inventory does not include values from natural background that are associated with materials placed in the cell that were not determined to be radiologically contaminated.

U-238	287 Ci
U-234	240 Ci
U-235	11 Ci
Th-230	5617 Ci
Th-232	678 Ci
Ra-226	157 Ci
Ra-228	54 Ci / (these total 7,044 Ci - dwm)

Regarding your request for the inventory of the *non-radioactive components* in the cell, I will assume that you are referring to the contaminants of concern (i.e., arsenic, nitroaromatics, etc.). Total mass inventory for the contaminants of concern (*non-radiological components*) is not a value that we have calculated and is, therefore, not available.”

[NOTE: I asked at the 6/27/02 stewardship workshop whether these values could be calculated, and Tom Pauling said, yes, they could be. I am not aware this has been done although I still think it should be and the data entered into the recommended cell inventory Appendix of this report).

“The **waste volumes** are as follows (grouped into the main categories and slightly rounded):

Soil, Soil-like, fine aggregates, treated sludges (soil-like also): ~1,180,000 cy; or 79.5% of the waste 13,000 (it includes ~ cy of treated residual sludges)

Grout (mainly chemically stabilized & solidified contaminated sludge): ~194,000 cy; or 13% of the waste (it includes 5700 cy grouted brine)

Concrete/rubble: ~85,200 cy or some 6%

Wood: ~1100 cy

Metals: ~13,000 cy

Other (boxes, liners, containers, HEPA, etc.): ~9,000 cy (it includes 900 cy of asbestos containing materials)” (end quote of Pam Thompson’s answer]

Response C-8: Comment noted.

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Upon receiving the above answer, which I considered to be an incomplete cell inventory list, on 8/23/02 I sent an e-mail to Pam Thompson asking for a more complete inventory listing of the disposal cell that included a location grid showing where the various contaminants had been positioned within the cell interior. I have not yet received an answer to this second request. I also sent this letter by regular mail at Pam Thompson's request as I had originally offered to do in my 8/23/02 e-mail.

C-9 | McKeel's remaining questions and suggested modifications to the draft plan concerning the inventory of the engineered disposal cell contents:

a) **Conflicts between subsections 2.3.2 and 2.2.2.2, and page 2-13 Table 2-3** (fails to mention recycled uranium as a cell component) **and Pam Thompson's reply to McKeel's 1-24-02 letter** need to be resolved and reconciled with one another. That is, **the contents and amounts of all materials in the disposal cell should be quantified and listed in the appropriate subsections of the plan which should complement rather than conflict with one another.**

Response C-9: See response to comments [A-7](#) and [A-56](#).

C-10 | b) If **recycled uranium** was placed in the cell, then by necessity the cell must contain some plutonium, neptunium and technetium - these should be mentioned and quantified. I should note that in several previous requests to Pam Thompson and to MDNR I had been unable to confirm that recycled uranium had definitely been received at WSSRAP or was known to be within the cell. So this information in the 8/9/02 LTSM plan subsection §2.2.2.2 was a complete, and worrisome surprise to me even though it confirmed DOE Ohio field office data. Together with the two mistakes made in listing the total cell radioactivity as **4,000 Curies in the 8/9/02 plan on page 2-16 and in Fig. 2-5**, rather than 7,044 Curies stated in July 2000 and January 2002 DOE response letters to Kay Drey and myself, respectively, it challenges DOE's credibility to produce valid radioactivity data. Also profoundly disturbing to me is that at first Pam Thompson said the 4,000 Curie figure was a "typo" and the calculations to arrive at the 4,000 Curie value would be forwarded to me. I requested this be done the next day by letter. Later the discrepancy was retracted by Pam Thompson in a response letter to me as a "mistake" and I was told the 7,044 Curie figure was the final number that would be used. (see (c) and (d)).

Response C-10: See response to comments [A-7](#) and [A-93](#).

C-11 | c) Comment and suggestion: I therefore recommend that all contaminants in the cell be included as a separate Appendix that lists not only what was placed in the cell but also what was tested for, regardless of whether or not measurable levels were found. This would include the **presence of PCBs** (Page 2-13, Table 2-3).

Response C-11: See response to comments [A-7](#) and [A-56](#).

- C-12 | d) State how much **radon gas** is inside the disposal cell and the release rate. It must be present since thorium constitutes the bulk of cell interior radioactivity.

Response C-12: Estimated radon gas inside the cell, 204 Ci, is contained in the final total activity estimate for the cell. As stated on page 14 of the *Completion Report for Radon Flux Monitoring of the WSSRAP Disposal Facility* (DOE/OR/21548-876) January 2001, the average measured radon flux was 0.55 pCi/m<sup>2</sup>/sec, which is within the background range of radon flux as reported by the National Council of Radiation Protection and Measurements in NCRP Report No. 103 *Control of Radon in Houses: Recommendations for the National Council on Radiation Protection and Measurements*. Radon also leaves the cell at the leachate collection and removal system (LCRS) vent pipe. Previous measurements have shown the radon concentration directly inside the vent pipe varying from 0 to 200 pCi/L, but the concentration is within background range a few inches outside of the exhaust point. At its highest flow rate, the amount of radon released from the LCRS vent pipe is comparable to that naturally released from 2 acres of land due to the naturally occurring radium present in soil, and the subsequent production and release of radon from the soil.

- C-13 | e) “**drums**” is not specific - what did the drums contain (if PCB oil was contained, then this should be listed and quantified)? How many drums were there? What size were the drums, e.g., 55 gallons?

Response C-13: See response to comments [A-7](#) and [A-56](#). PCBs oils were not placed into the disposal cell.

- C-14 | f) At the 8/28/02 LTSM workshop two of the groups asked whether the cell contents could undergo **spontaneous combustion** and both questioners were told, **no**, because there was insufficient organics that could combust. Also, I was told there was no possibility of heat buildup hence no temperature sensors are installed to monitor the temperature of the cell interior. This answer seems inadequate and falsely reassuring because more than 10,000 cy of “wood, boxes, liners, containers” are housed within the cell. Recommend: A statement should be added regarding interior temperature monitoring within the cell and the potential of a fire developing.

Response C-14: The concerns raised by the comments is valid for certain well-defined scenarios, most of which involve either composting protocols or disposal of organic mass in demolition or municipal landfills. The commentators reference the quantity of more than 10,000 cubic yards of wood or other similar materials incorporated into the waste mass as a possible source of excessive heat generation.

Decomposition of vegetative organic mass may follow two fundamentally different biochemical processes: aerobic or anaerobic. Aerobic processes, characterized by presence of sufficient Oxygen, moisture and nutrients, are exothermal in nature. Heat in the decomposing mass raises continuously until it reaches a level unsustainable for the bacterial life. Further temperature increases, to the point of combustion, is possible solely through chemical reactions. In the absence of chemical reagents capable to



sustain such reactions, the bio-mass reverts to an anaerobic decomposition process. Anaerobic processes are not exothermic and thus the temperature decreases to that of the surrounding environment.

The organic materials present in the Weldon Spring Disposal Facility were not placed in configurations that would have encouraged exothermal decomposition. All wood products were disposed in accordance with one of the following two scenarios:

1. Wood that could be chipped or otherwise similarly size reduced was mixed with soil in a homogeneous mixture containing no more than 30% by volume wood waste. The resulting mix behaved and was placed and compacted as regular soil.
2. Wood pieces that could not be size reduced (large root balls for example) were entombed in CSS grout or in common soil waste. In either case, they were spaced from one another in the soil mass such as no detrimental local settlement may occur. A corollary to this spacing was that no piling of combustible materials was possible.

The dispersion of organic matter in the entombing soil mass and the presence of thick and dense overlying layers of soil, synthetic liners and rock do not create favorable conditions for oxygen ventilation, the environment being lethal for aerobic bacterial decomposition. Anaerobic processes are possible and predictable, but they do not result in heat generation.

Temperature monitoring of the cell interior would be at the best futile, since no heat is expected to be produced. Additionally, since the upper clean layers are an excellent temperature buffer, any non-intrusive monitoring would be impossible. Intrusive monitoring would compromise the integrity of the cell encapsulation system, with no evident benefits.

There is however some information regarding the cell internal temperature ranges. A second source of organic decomposition, not referenced by the commentator is the Geochemical Barrier Layer. Since this layer is directly above the primary LCRS, a temperature build-up would transfer to the leachate and would be detected in the LCRS external sump. Measurements of the leachate temperature indicate only a 50 to 60 degrees range, typical for deep soil-type of environments, buffered from external variations.

- C-15 | g) The total masses of non-radioactive toxic chemicals and metals placed within the cell should all be calculated and each such compound should be identified by name: e.g., arsenic, lead, PCB, etc. just as was done with the radioactivity “simply by taking the specific activity of the waste streams (contaminated soils, sludges and other materials) and multiplying by the volume.” This should be as easy to calculate for arsenic, for example, as it is for uranium. These calculations should be listed.

Response C-15: See response to comments [A-7](#) and [A-56](#).



C-16 | h) The nature of the “process equipment” should be stated. Does this include any trucks used to haul radioactive materials from the Quarry to the cell as I have heard rumored? This should be a straightforward “yes” and “no” issue with the number and type of trucks and vehicular or earth-moving or plant production equipment contained within the cell listed in the inventory list if the answer is “yes.” **Future generations will absolutely need to know the exact cell contents in order to take appropriate response actions if the cell integrity is breached during a terrorist attack, for example.** What will escape? How should rescue workers be equipped/dressed?

Response C-16: See response to comments [A-7](#) and [A-56](#). No haul trucks were disposed in the cell. DOE’s approach to the work minimized opportunities to contaminate equipment and maximized decontamination efforts. There were times when the cost to decontaminate equipment or equipment parts would have been greater than the replacement costs. In those instances, DOE disposed of the items in the cell. In all instances the equipment or parts met the size limitations or were encapsulated in grout or soil to eliminate void space. Included among items disposed in the cell were a 2-ton truck from the operating time period and the following contaminated equipment from the remedial action time period: one bobcat, one tractor trailer mounted water tank, one soil/debris separator, and two cement mixer drums. Some equipment parts such as bull dozer blades were also disposed in the cell in accordance with the waste placement criteria.

**Contingency Planning** - No further comments at this time over and above those I have made about the false assumptions made in choosing Darst Bottoms as the best alternate location for a compromised St. Charles county well field. I must say again I find the pattern of choosing a contaminated region as “background” and making subsequent comparisons to it is one of the most disturbing aspects of this report.

C-17 | **Disposal cell** - Heat sensors should be installed or the 8/9/02 document should be revised to state why this was not necessary in light of the fact that the cell contains ~10,000 cubic yards of combustible materials.

Response C-17: See response to [comment C-14](#).

**Final Site Conditions** - No further comments at this time.

**Ground water** - No further comments at this time.

**Inspections** - No further comments at this time.

C-18 | **Institutional controls (and Use restrictions)** - Please refer to Point [2] regarding recommended new ICs for the Hamburg Trail (old haul road) and the disposal cell. These might involve signage, and public access and usage restrictions for recreational purposes. I stress again the sentiments of the Social Concerns Committee in their four petitions concerning the site that were delivered to Pam Thompson on June 4th of this year the day before the closed interagency meeting to which WSCC was invited but not the general public or the press:

Response C-18: See response to comment [C-4](#).

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***SCC-ICD PETITION SUMMARY INFORMATION***

***Dan McKeel, M.D. for the steering committee***

***-- April 4, 2002 --***

*The Social Concerns Committee-Immaculate Conception Parish-Dardenne (St. Charles county, MO) steering committee created four petitions which received the following numbers of signatures: I (n=189), II (n=187), III (n=186), IV (n=170). [Note additional signatures have been received after this date]. All of the petitions address issues related to the Weldon Spring Superfund site in St. Charles county that has been remediated by the U.S. Department of Energy and the U.S. Army. Total remediation costs to taxpayers has been in excess of 900 million U.S. dollars. Active remediation of the site is scheduled to terminate by October 1, 2002 when the site will enter the phase of Long Term Stewardship.*

C-19 | **PETITION I:** *I/We request that the Department of Natural Resources continually monitor spring 6306 (behind Carriage Hills Subdivision) as well as spring 6301 (Burgermeister in Busch Wildlife Conservation Area) due to a history of high uranium content levels. There should be a long-term sampling of these springs, taken at least every six months with the reports published and made available to the public in a timely manner. (187 signatures thus far).*

Response C-19: See response to comment [A-155](#).

C-20 | **PETITION II:** *I/We request that warning signs with sufficient information be posted for the public about the true nature of what is being remediated (especially along the Katy Trail, near the quarry, and lakes 34, 35 and 36), and that contamination maps be provided to visitors as per ATSDR's 1995 recommendations. The public needs to be told about all radioactive compounds such as uranium, thorium and radium, plus explosives (TNT) residues and other specific toxic agents (PCB's, nitrates) and heavy metals (lead). (187 signatures thus far)*

Response C-20: See response to comment [A-85](#).

C-21 | **PETITION III:** *I/we strongly oppose construction of the proposed Hamburg public access "recreational" trail to the top of the disposal cell that contains 7,000 (or more) Curies of potentially lethal, buried radioactive uranium, transuranics (such as plutonium), and other radionuclides (thorium, radium) in addition to non-radioactive extremely hazardous compounds.*

*With the amount of dangerous waste buried in the cell, we find this idea unnecessary and dangerous, especially in light of recent terrorist attacks. (186 signatures thus far)*

Response C-21: See response to comment [A-92](#).

C-22 | **PETITION IV:** *I/We feel that an unmanned Interpretive Center will not serve the interests of the citizens. The probability of vandalism and the destruction of records stored indicates the obvious need for a manned Interpretive Center with trained staff and electronic access to the records. (170 signatures thus far)*

Response C-22: See response to comment [A-15](#).

C-23 | **Table 2-12** Details of “restrictive easements” to restrict consumption of water in Spring 6301 (and other springs listed) should be spelled out as to how this would work given the fact that absolutely no physical access barriers or warning signs are present at Burgermeister spring. We have videos made in June of 2001 that show this conclusively. It is essential that the specifics of all institutional controls be spelled out as quickly as possible for every control listed in this Table on page 2-42 of the 8/9/02 report. Since the Katy Trail portion south of the Quarry is in the middle of the high contamination uranium zone, the posting of warning signs is absolutely essential under the public Right to Know principle. Ignoring this, as MDNR and DOE have done in the past, constitutes wanton disregard of the public health and safety. Hiding behind ATSDR’s false idea of “no exposure route, hence no possible adverse health effect” doctrine is negligence on the part of agencies who accept and support this flawed doctrine [see references 2-4].  
If, in the future, lawsuits are instituted to redress these irresponsible policies that have been allowed for many years at the site, then the responsible agencies have nothing but their own policies to blame. As I write this I ask myself over and over, why all the pretense about belatedly instituting proper institutional controls years after the population has been exposed to grossly elevated radioactivity and the cancer latency clock began ticking years ago?

Response C-23: See response to comments [A-70](#), [A-82](#), [A-85](#) and [A-127](#).

C-24 | **Land use controls** - The legal documents that implement these need to be included in the next version of the LTSM plan in APPENDIX A.

Response C-24: See response to comment [A-5](#).

C-25 | **Leachate collection and disposal system** - There was some confusion expressed by public stakeholders at the 8/28/02 stewardship workshop about the manner in which Metropolitan Sewer District handles leachate uranium and other radioactive and chemical reagents obtained from WSS. Unclear points included whether and how MSD treated the uranium-contaminated leachate before releasing it to the Mississippi River.  
Recommendation and comment: Include the MSD leachate contract as one of the legal documents in Appendix A.

Response C-25: See response to comment [A-165](#).

C-26 | **Long-Term Stewardship Plan** - I endorse all the sentiments expressed by the WSCC in their letter read at the 8/27/02 regular meeting. In this instance, WSCC did speak for me in an eloquent manner. I underscore their sentiments that adequate thought and provisions need to be made to ensure public participation at the site by holding annual meetings, inspection data mailings, up-to-date website information, availability of all key site documents at the St. Charles county library or other county building or on the GJO GIS database.

Response C-26: Comment noted.

### **Long-Term Surveillance and Maintenance Plan**

**Maintenance** - No further comments at this time

**Monitoring** - No further comments at this time

C-27 | **Operable Units** - A target date for implementing the Groundwater ROD should be stated. The Interceptor trench pilot study should be redefined as a disappointing experiment rather than as a “success” since less than 1% of the target uranium was actually removed over the two year period of operation.

Response C-27: See responses to comments [A-63](#), [A-64](#) and [A-71](#).

**Ownership** - No further comments at this time

**Property Ownership** - No further comments at this time

C-28 | **Public Information** - I am very skeptical about direct access by the public and other stakeholders to key site WSOW/WSSRAP documents that are dispersed in an unclear way among five places: WSSRAP site, WSOW site (where - Kansas City USACE office?), Kansas City federal archives, St. Charles public libraries, DOE Grand Junction Office. I am also skeptical about general statements promising documents will be on websites. Which documents? Who will post them? I note that very few WSSRAP documents and reports are currently being posted on the WSSRAP website. For example, the two Quarry Interceptor Trench reports (Performance and Geophysical) are not posted. I am interested in obtaining WSSRAP site historical photographs and have been unable to learn about the availability or location of these documents or whether there is an index to them. How will the WSCC be able to continue to effectively monitor site operations if the main documents are in Colorado at GJO? Where are the drawings and photographs now mentioned in §2.7? Are these at Grand Junction; how can we know? How can we access them? How long will it take?

Response C-28: See responses to [A-15](#), [A-142](#), [A-212](#) and [A-220](#).

**Regulatory requirements** - No further comments at this time

**Reports** - No further comments at this time

**Surface Water** - - No further comments at this time

## McKeel Comments, Part 2, References

1. MoDNR Division of Environmental Quality, Hazardous Waste Program, Federal Facilities Section, <http://www.dnr.mo.us/deq/hwp/ffss.htm>, "Weldon Spring Site", section §2.4, p.23, Table "Estimated Site-Wide Long-Term Stewardship Costs."

**Recent peer-reviewed articles showing the deleterious health effects of TCE and uranium metal and radioactivity in drinking water not necessarily confined to cancer induction**

2. Kilburn, Kaye H. Is neurotoxicity associated with Environmental Trichloroethylene? Archives of Environmental Health **57**(2): 113-120, 2002.  
**[Clearly the answer is Yes, TCE causes cognitive impairment in humans by damaging the central nervous system/brain]**

3. Kurttio P, Auvinen A, Salonen L, Saha H, Pekkanen J, Mäkeläinen, Väisänen SB, Penttillä IM, Komulainen H. Renal effects of uranium in drinking water. Environmental Health perspectives **110**(4): 337-342, 2002 (May)

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**"In conclusion, uranium exposure is weakly associated with altered proximal tubulus function without a clear threshold, which suggests that even low uranium concentrations in drinking water can cause nephrotoxic effects."** Also, "... safe concentration of uranium in drinking water may be within the range of the proposed guideline value of 2-30 µg/L." In other words, the upper limit is above the safe limit.

4. Mao M, Desmeules M, Schaubel D, Berube D, Dyck R, Brule D, Thomas B. Inorganic components of drinking water and microalbuminuria. Environmental Research **71**(2): 135-140, 1995.

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**[This paper shows that uranium metal acutely causes renal damage and chronically results in microscopic glomerular damage sufficient to cause excess albumin, a major plasma protein, to leak into the urine.]**